Canadian Centre for Occupational Health and Safety

Centre canadien d'hygiène et de sécurité au travail

The Extended Workday
Health and Safety Issues

P87-9E

88-01693/

THE EXTENDED WORKDAY

Health and Safety Issues

Ilene Stones MES

Canadian Centre for Occupational Health and Safety

December 1987

CCOHS/CCHST

THE EXTENDED WORKDAY--HEALTH AND SAFETY ISSUES

This publication was prepared as a source of information for health and safety committees and others with an interest in understanding and reducing the occupational risk involved with the extended workday.

Each publication produced by CCOHS undergoes several stages of review. As a part of this review, representatives from government, employers, and labour are requested to comment on draft copies of CCOHS documents for technical accuracy and readability.

Although every effort is made to ensure accuracy and completeness of the information, it is understood that CCOHS makes no warranty as to the accuracy or completeness of such information and assumes no liability for any damages or loss suffered as a result of any inaccuracy or incompleteness therein.

This publication is available in both official languages.

Cette publication est disponible dans les deux langues officielles.

CCOHS NUMBER P87-9E
ISBN 0-660-12542-0
DSS CATALOGUE NUMBER CC273-2/87-9E

Published 1987

Additional copies available upon request.

---

250 Main Street East
Hamilton, Ontario
L8N 1H6
(416) 572-2981
Telex 061-8532

TABLE OF CONTENTS

	INTRODUCTION	(ii)
1.	FATIGUE	1
2.	SOCIAL LIFE	2
3.	SAFETY	2
4.	EXPOSURE TO PHYSICAL AND CHEMICAL HAZARDS	3
5.	CHOICE OF JOBS	3
6.	GUIDELINES FOR THE EXTENDED WORKDAY	4
7.	CONCLUSION	5
	REFERENCES	6
	FURTHER READING	7

CCOHS/CCHST

INTRODUCTION

Work schedules are important for both the organization and the worker. They have an effect on health, safety, family, and social life. The traditional schedule of eight hours, five shifts per week is not the only possibility. Alternate work schedules are being adopted by many organizations in almost every sector. One alternate work schedule is the extended workday, also called the compressed workweek. With this schedule a longer day or shift (up to twelve hours) is worked in fewer days per week. By squeezing the traditional thirty-six to forty-hour workweek into three or four days, the number of consecutive days worked is decreased and the number of consecutive days off is increased.

Many hospital, industrial, transportation, mining and office organizations are adopting the extended workday because it offers several advantages. It allows workers more uninterrupted time for family and other activities, and less night work. It requires them to work fewer consecutive night shifts and provides them with longer blocks of time off to recuperate. Moreover, it allows them to commute to and from work less often and at times when traffic is light.

The disadvantages of the extended workday are that it contributes to fatigue and allows little opportunity to do much more than work, eat and sleep on workdays.

Assessing the advantages and disadvantages of the extended workday involves considering the mental and physical demands of the work, worker preferences, and other worker responsibilities such as child care. Implementing an extended workday schedule may require obtaining expert advice to re-evaluate the effects of possible workplace physical and chemical hazards on workers.

The extended workday presents a challenge to the health and safety of workers. The exact nature of the challenge is not clear. Unfortunately, few studies identify the long- or short-term health and safety effects of the extended workday. In the past, information from workplaces have consisted of short-term personal observations or non-scientific surveys to evaluate the acceptability of a particular schedule.

CCOHS/CCHST

Laboratory studies of the effects of extended performance cannot always be applied to the workplace. The health and safety consequences of adopting an extended workday are therefore not always clear and the uncertainty can complicate decision-making.

The health and safety issues must still be addressed. Awareness of known information is important since the extended workday is presently being used, and more organizations are implementing this schedule every year.

This document explores the health and safety challenges of the extended workday and provides guidelines on how to implement this type of work schedule.

CCOHS/CCHST

1. FATIGUE

Fatigue is a message to the body to rest. It is not a problem if the person can and does rest. However, if rest is not possible, fatigue can increase until it becomes distressing and eventually overwhelming.

Many conditions can lead to fatigue and cause a variety of effects in a person. Weariness, sleepiness, irritability, reduced alertness, lack of motivation, increased susceptibility to illness, depression, headache, giddiness, loss of sleep, loss of appetite, and digestive trouble are examples of potential reactions to fatigue.

Fatigue resulting from long hours of work and a shorter length of time between work shifts is an important concern for the health and safety of workers on the extended workday. Some researchers report that in many cases the extended workday is more tiring than the eight-hour day.(1) They often argue that workers will be too tired by the end of ten or twelve hours worked and jeopardize their own well-being, as well as the safety of others on the job.

Others report that the eight-hour work schedule is tiring, particularly when many consecutive shifts must be worked with few consecutive days off.(2,3) The extended workday has the advantage over the eight-hour day schedule that fewer consecutive shifts are required and longer periods of time off allow for better rest. Sometimes the longer period of time off compensates for the longer workday.

Another concern about the extended workday is that during the workweek, workers can only do their job and eat and sleep. This creates two problems. First, most workers need a certain amount of time to relax after work and before sleeping. When there are only twelve or fourteen hours between shifts, this time is reduced. Second, workers with other types of responsibilities such as child care, may find the extended workday tiring because they still have tasks to do when they return from work.(4)

Many workplace factors make physical and mental demands of the workers that affect health, safety and fatigue. Examples of

such factors are job design, lighting, air quality and workstations. Reducing any source of fatigue helps workers deal with all of the demands of their work including the work schedule. For example, a well-designed tool, an extra rest break or a better chair can help reduce the overall demands of a particular job.

2. SOCIAL LIFE

One of the primary advantages of the extended workday is that it provides more consecutive days off than most other types of schedules. This allows more free days for family and other activities. However, the disadvantage is that the long hours do not allow much free time on workdays. This can affect family and social life. Whether the advantage of longer blocks of time off outweighs the disadvantage of little time off on workdays, or vice versa, is not clear.

It appears that critical factors for the adjustment of individuals to an extended workday have to do with characteristics such as age, marital status, parental status, personal hobbies, and interests.(5) Workers who have several major responsibilities may have more difficulty with conflicting demands for time on extended workdays, particularly the twelve-hour day. On the other hand, unmarried workers may enjoy the long period of time off and the opportunity for social and leisure activities.(6)

Time spent travelling to and from work is often viewed by workers as lost time. The extended workday obviously means fewer trips to and from work and therefore less wasted time, less cost, and less travelling during peak traffic times.

3. SAFETY

An issue often raised in conjunction with the extended workday is the effect of extended hours on accident and injury rates. The concern is that increased fatigue will contribute to accidents. While this concern seems logical, it cannot be supported with evidence. It is clear that an accident occurs as part of a process involving a combination of technical, personal, behavioural, environmental and work process factors. The length of the workday is only one factor to consider in accident causation.

4. EXPOSURE TO PHYSICAL AND CHEMICAL HAZARDS

Exposure to physical and chemical hazards is always a health and safety concern. When the workday is lengthened, the degree of exposure needs to be re-evaluated to ensure that acceptable levels are not exceeded.[8,9] Areas of particular concern are exposures to chemicals, noise, vibration and extreme temperatures. Any method for determining exposure levels for the extended workday should be used with caution and under supervision. Expert advice may be necessary to determine acceptable exposures for an extended workday.

The proper and efficient use of personal protective equipment during an extended workday should also be considered. For example, uncomfortable hearing protectors cannot provide protection if workers find them uncomfortable and do not wear them when they should. Comfort over the whole work shift is important to usage.

5. CHOICE OF JOBS

Perhaps the most difficult decision with the extended workday is the question of what type of work is suitable for this type of schedule. Since no objective list of criteria exists, there is no easy answer. In most cases, it may be beneficial to have trial experiments in specific situations to monitor the health and safety aspects of particular jobs and the acceptance by a particular workforce. The physical and psychological effort required by a job, environmental conditions such as temperature and vibration, and job characteristics such as boredom and repetitive work all contribute to the acceptability of the extended workday.

With these points in mind, some general statements can be made. The sparse information which is available indicates that jobs that do not require a high degree of physical exertion or that have natural resting periods may be most suitable for the extended workday schedule. For example, a machinist who has cycle time between set-ups that allows reduced attention while the machine is running can probably work a longer day. On the other hand, a data entry operator who must continually enter data while sitting in one position and concentrating for long periods would find the extended workday more difficult. Workers whose work involves creative activities may benefit from this type of schedule as it allows them to work intensively on projects while providing more time away to rest.[4]

Workers on eight-hour rotational shiftwork schedules might prefer the extended workday because it requires fewer consecutive night shifts and allows more recuperative time.(10)

6. GUIDELINES FOR THE EXTENDED WORKDAY

To help with the decision of whether or not to use or continue to use an extended workday schedule, the following guidelines are suggested:*

Consult workers about their desire to have a change in the work schedule and specifically an extended workday.

Consider the physical demands of jobs, occupational hazards such as chemicals or noise exposures, and aspects of job design, such as rest schedules. Changes in the environment or job design can sometimes make an extended workday more acceptable.

Consider the mental and emotional demands of the job. Work that requires constant attention or intense mental effort may be less acceptable for the extended workday. Use additional rest breaks or variation of job tasks to help decrease the strain of the extended workday.

Consider the workers and the other demands on their time. People who have other significant responsibilities each day may require additional support such as child care facilities. Seasonal demands may also have to be considered.

If the decision is made to try the extended workday, establish an experimental period. Introduce the extended workday gradually to small groups to allow more flexibility and better analysis of the situation. Evaluate the success of the new schedule by doing the following:

Monitor health and safety. Look for any changes in accident rates, health levels and especially fatigue.

---

* In various jurisdictions labour legislation requires government approval to schedule more than eight hours of work per day and to average hours over longer time periods. Legislation may require the organization to show that workers are aware of and understand the implications of the extended workday, and that workers genuinely want to work such a schedule.

Look for any changes in absence rates. Even though absence is not always a good measure of health or ill health, an increase may indicate a problem. On the other hand, a decrease may indicate that the extended workday is successful.

Listen to and solicit input from workers to determine their satisfaction and acceptance of the extended workday.

7. CONCLUSION

The extended workday provides longer periods of free time with the primary disadvantage that few other activities can be considered on workdays. Whether the advantages of the longer periods of time off outweigh the disadvantage of less free time on workdays depends on the mental and physical demands of the job and the worker's lifestyle and responsibilities. At present there is no clear evidence that the extended workday adversely affects health and safety. The main health and safety issues are fatigue, increased risk for accident and injury, changes in patterns of exposure to chemicals and physical hazards and the effects on social and family life. Where the extended workday is used, close monitoring is required of employee acceptance, health and safety.

REFERENCES

1. Goodale, J.G.; Aagaard, A.K. Factors relating to varying reactions to the 4-day workweek. Journal of Applied Psychology. Vol. 60, no. 1 (1975). p. 33-38

2. Volle, M.; Brisson, G.R.; Pérusse, M.; Tanaka, M.; Doyon, Y. Compressed work-week : psychophysiological and physiological repercussions. Ergonomics. Vol. 22, no. 9 (1979). p. 1001-1010

3. Wilson, J.T.; Rose, K.M. The twelve-hour shift in the petroleum and chemical industries of the United States and Canada : a study of current experience. (Industrial research reports ; No. 26). Philadelphia : University of Pennsylvania, 1978

4. Cohen, A.R.; Gadon, H. Alternative work schedules : integrating individual and organizational needs. Reading, Mass. : Addison-Wesley Publishing, 1978

5. Mahoney, T.A.; Newman, J.M.; Frost, P.J. Workers' perception of the four-day week. California Management Review. Vol. 18, no. 1 (Fall 1975). p. 31-35

6. Dunham, R.B.; Hawk, D.L. The four-day/forty-hour week : who wants it? Academy of Management Journal. Vol. 20, no. 4 (Dec. 1977). p. 644-655

7. Wynn, S.C. The impact of the twelve hour shift on petrochemical process operators. [Edmonton, Alta.] : Alberta Workers' Health, Safety and Compensation, 1979

8. Brief, R.S.; Scala, R.S. Occupational exposure limits for novel work schedules. American Industrial Hygiene Association Journal. Vol. 36 (June 1975). p. 467-469

9. Hickey, J.L.S.; Reist, P.C. Application of occupational exposure limits to unusual work schedules. American Industrial Hygiene Association Journal. Vol. 38, no. 11 (Nov. 1977). p. 613-621

10. Stones, I. Rotational shiftwork : a summary of the adverse effects and improvement strategies. Hamilton, Ont. : CCOHS, 1987

FURTHER READING

Colligan, M.J.; Tepas, D.I. The stress of hours of work. American Industrial Hygiene Association Journal. Vol. 47, no. 11 (Nov. 1986). p. 686-695

Colquhoun, W.P.; Blake, M.J.F.; Edwards, R.S. Experimental studies of shift-work III : stabilized 12-hour shift systems. Ergonomics. Vol. 12, no. 6 (1969). p. 865-882

Crump, K.C.; Newson, E.F.P. Implementing the 12-hour shift : a case history : results of a study conducted at the University Hospital in London, Ontario. Hospital Administration in Canada. (Oct. 1975). p. 20-24

Cunningham, J.B. Exploring the impact of a ten hour compressed shift schedule. Journal of Occupational Behaviour. Vol. 2 (1981). p. 217-222

Davis, C. Evaluating the 12-hour shift schedule. Dimensions in Health Service. Vol. 59, no. 6 (June 1982). p. 30-31, 33-34

Eaton, P.; Gottselig, S. Effects of longer hours, shorter week for intensive care nurses. Dimension in Health Service. Vol. 57, no. 8 (Aug. 1980). p. 25-27

Mital, A. Maximum weights of lift acceptable to male and female industrial workers for extended work shifts. Ergonomics. Vol. 27, no. 11 (Nov. 1984). p. 1115-1126

Munson, J. Monsanto tries 12-hour day. Supervision. Vol. 40, no. 2 (Feb. 1978). p. 1-2

Robison, D. DuPont's 12-hour shift experiment turns up surprising benefits. Personnel Journal. Vol. 57, no. 5 (May 1978). p. 234, 269

Staples, S.; Curtis, B.L. Extended workday : two years later. Hospital Administration in Canada. (Jan. 1975.) p. 23-24

Tellier, R.D. The four-day workweek and the elderly : a cross-sectional study. Journal of Gerontology. Vol. 29, no. 4 (1974). p. 430-433